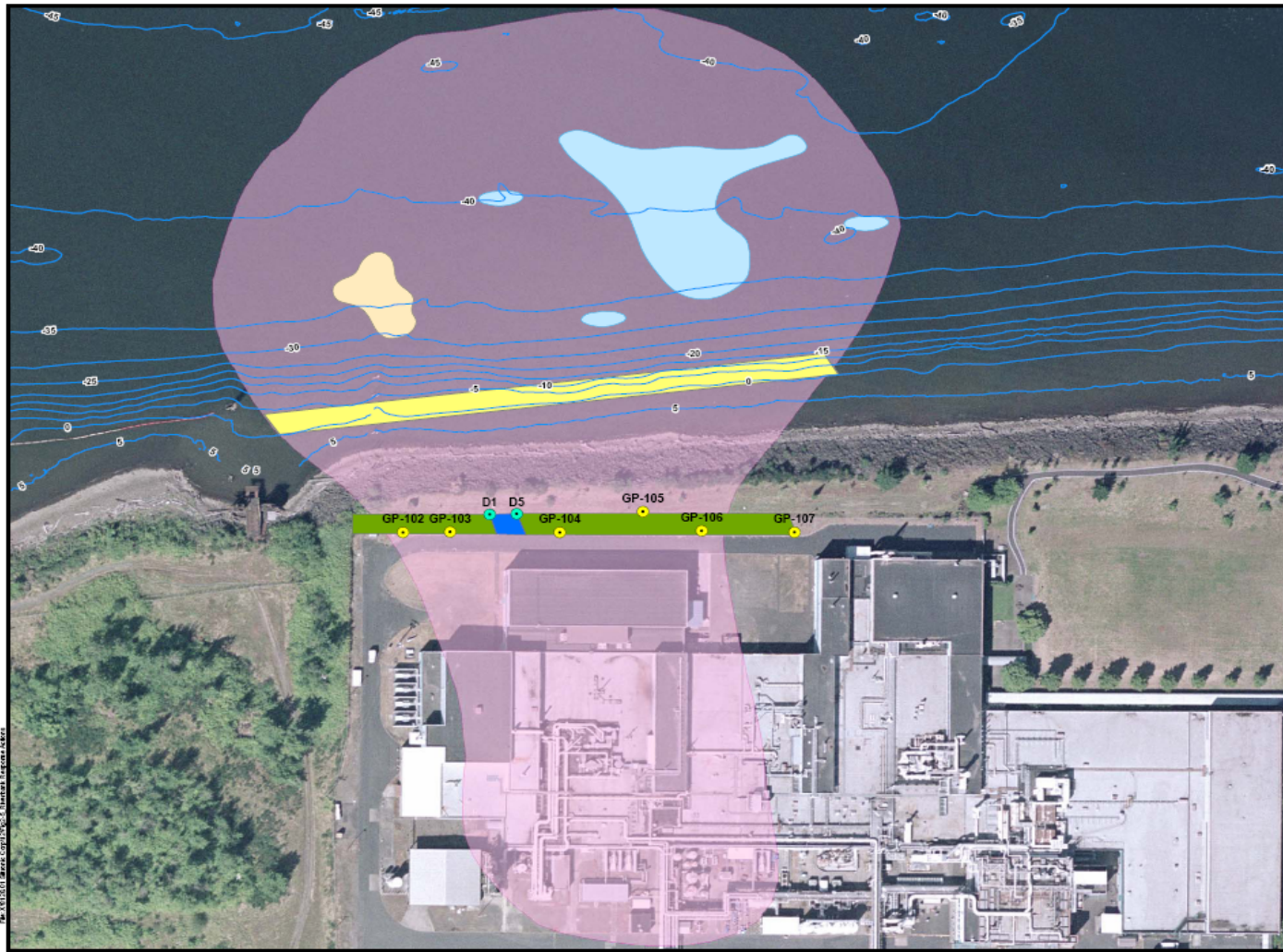


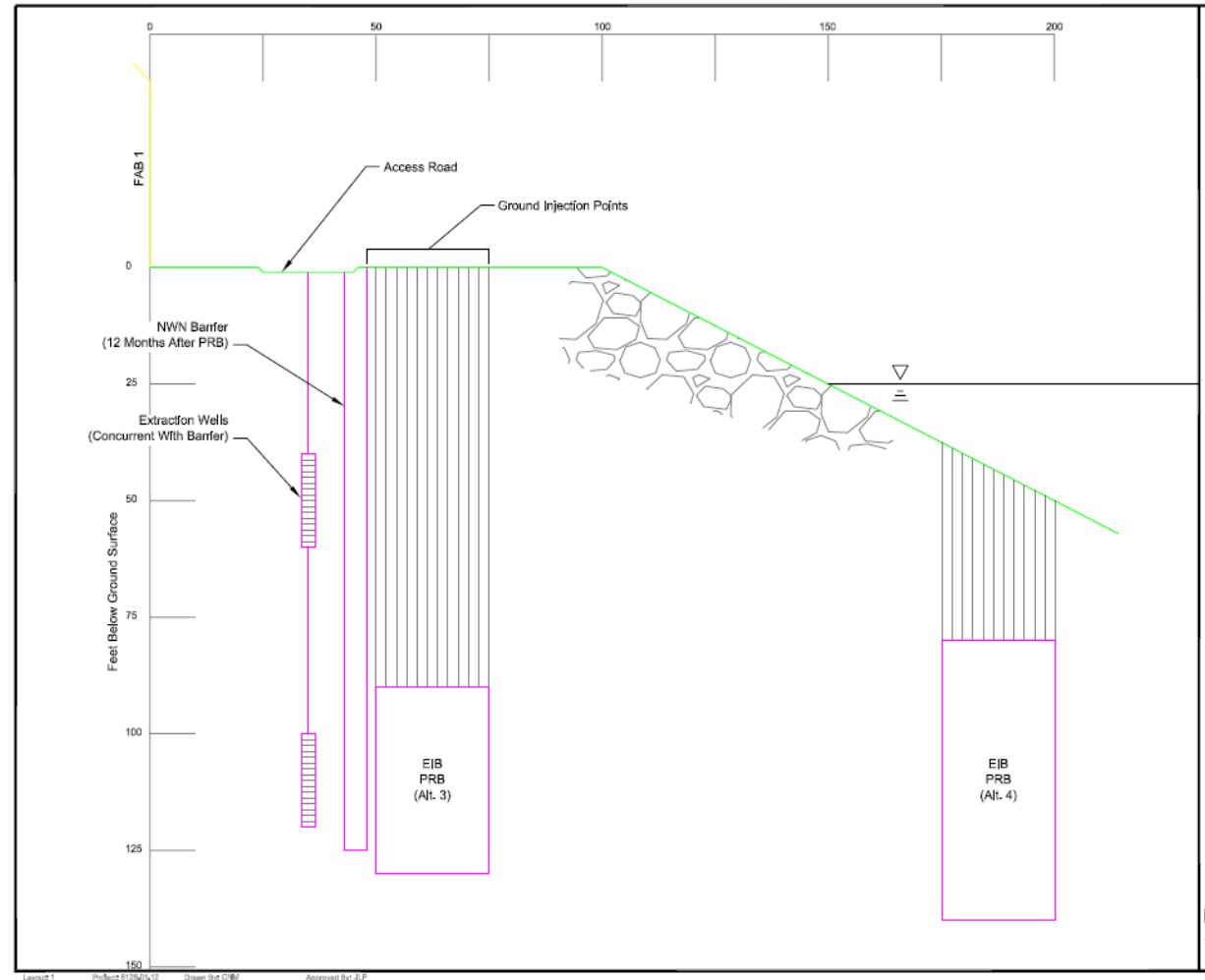
# Physical Interference with SCMs



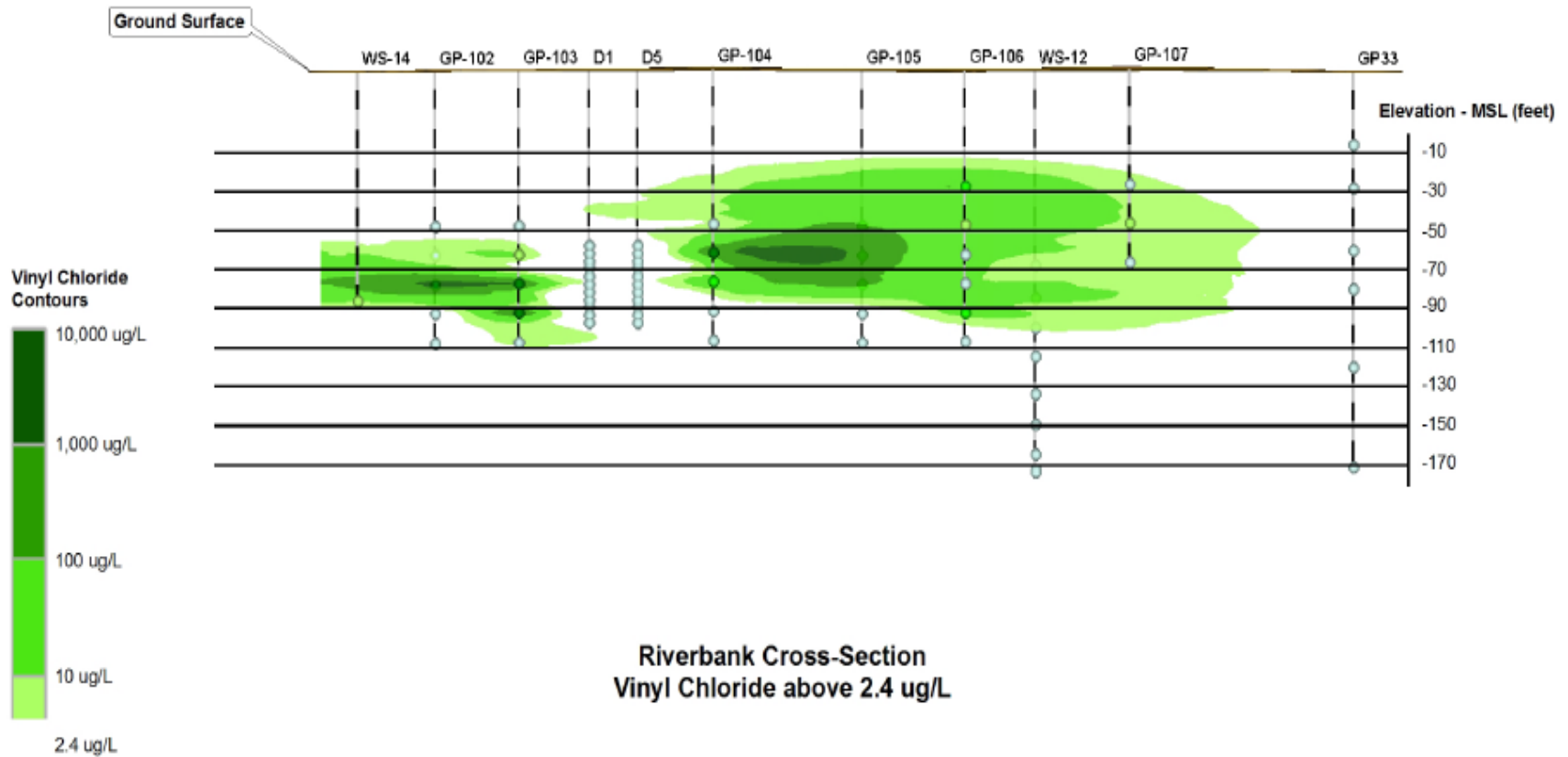
Slide Package #4

# Physical Interference with SCMs (cont.)

- Minimum dimensions of EIB PRB is 850 feet long by 40 feet deep (~90 to 130 feet bgs) by 25 feet wide (at riverbank)



# Physical Interference with SCMs (cont.)





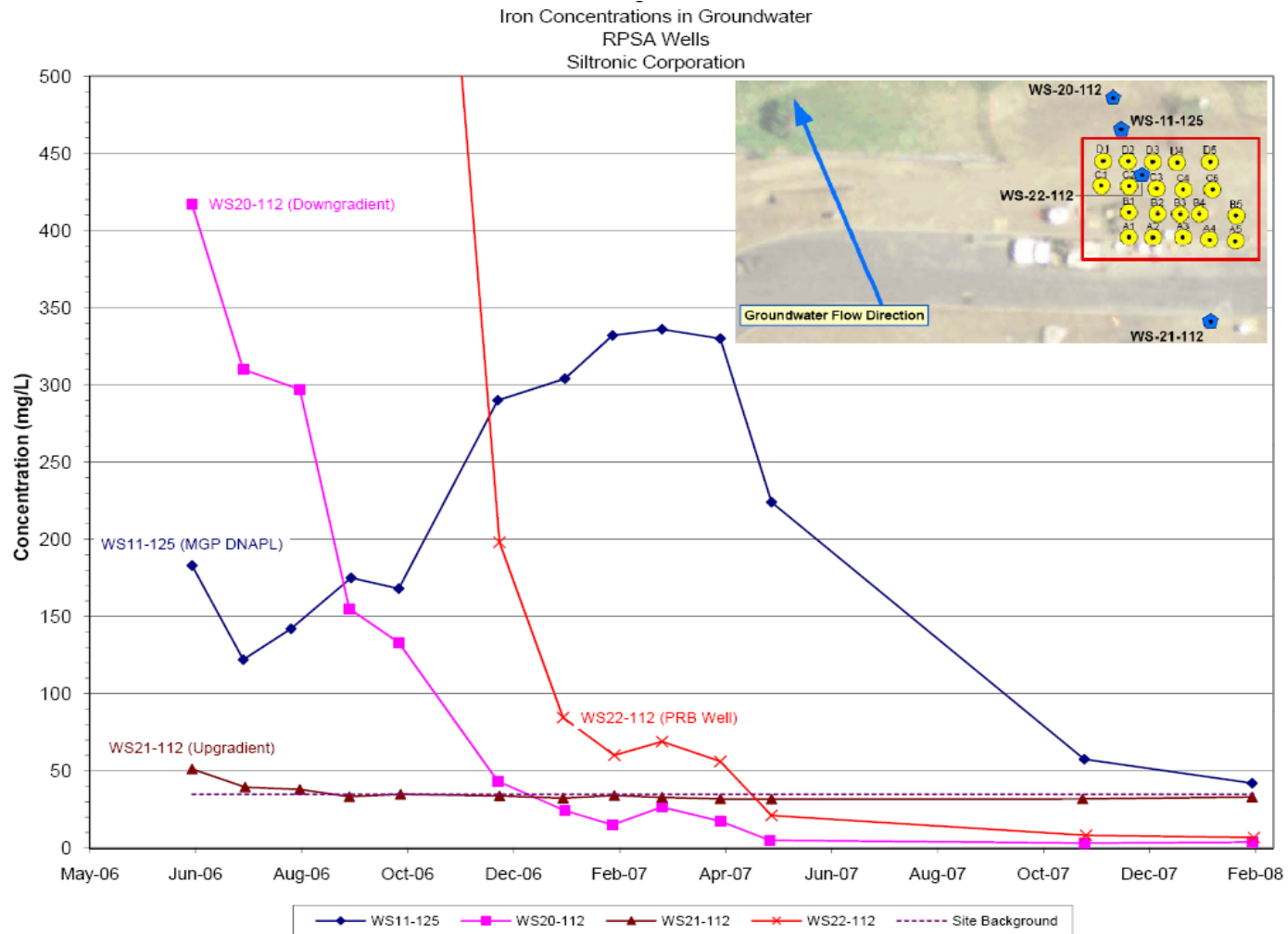
# Physical Interference with SCMs (cont.)



# Chemical Interference with SCMs

- EHC drives redox down to levels that could influence bentonite-based slurry walls
- Minimum of 300,000 pounds of ZVI needed for EIB
- Inorganic groundwater chemistry significantly altered
  - Ex. Total iron concentrations increased from less than 50 mg/L to over 2,000 mg/L during pilot study
- Depending on location, dissolved iron persists in groundwater above background for at least 16 months
- EHC expected to “actively enhance the bioremediation conditions for a period of 3 to 5 years”

# Chemical Interference with SCMs (cont.)



R:\8128.01 Siltronic Corp\Correspondence\12\_FFS Response to Comments 3.6.08\response support data-Figures 1-3.xls

Recent data subject to qualification/revision

# Potential River Impacts

- Direct discharge of injectate
- Inorganic groundwater chemistry in close proximity to river significantly altered
- River is water quality limited for iron
- Total iron concentrations increase from less than 50 mg/L to over 2,000 mg/L
- Dissolved iron persists in groundwater above background for at least 16 months
- EIB byproducts increase downgradient (e.g., 2-butanone and acetone)
  - Ex. Acetone from 10U to over 2,800 ug/L

## Alternatives to EIB Available for Area 1

- Natural attenuation is occurring, Siltronic estimates Area 1 reduction in ~15 years
- Capping being considered as an element of NW Natural's in-water work



# EIB & SCM Sequencing

- Siltronic indicates SCMs can be implemented within 1 year of EIB implementation
- DEQ considers projection limited by certain assumptions including:
  - Move from FFS to injection
  - Single EHC application is sufficient to achieve goals
  - One aquifer pore volume is sufficient to “significantly” reduce cVOCs in TZW
  - Travel times for treated water to migrate throughout plume & Area 1
- Performance monitoring & triggering SCMs implementation

# DEQ's Decision

- DEQ decision - use of EIB in the cVOC release area combined with SCMs designed to control and contain contamination migrating to the river
- Key considerations in DEQ's decision;
  - cVOCs commingle with MGP contamination, but EIB addresses cVOCs only
  - Physical/chemical interference with implementation and operation of NW Natural's SCMs
  - Postponement of SCMs construction and uncertainty as to how/when to trigger implementation
  - Potential impacts to river
  - Availability of alternatives (e.g., natural attenuation, capping)